

## 1. Introduction

In metallurgical industry, wire drawing machine is an important equipment in the production of metal wire, the main function is to pull all kinds of wire into a variety of specifications of the filament. From working form and mechanical structure, there is straight line type, water tank type (Double frequency inverter control type), dancing type wiring drawing machine. For different accuracy and different specification products, different types of metal, we can choose different specification wire drawing machine. For copper and aluminum substrate of wire and cable manufacturing enterprises, water tank type wire drawing machine application widely, and for most steel wire production enterprises, according to the characteristics of the steel, straight line wiring drawing machine application widely. Among them, water tank type wire drawing machine is the most widely used.

The following introduction of water tank type wire drawing machine (Double frequency inverter control type) technology and electrical control theory

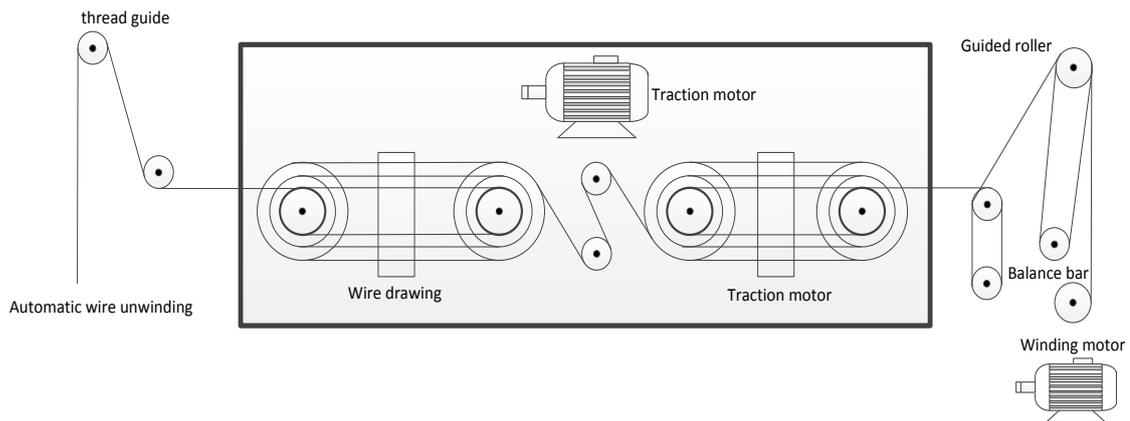


Figure 1-1

## 2. Technology requirement & introduction

### (1) Unwinding:

In unwinding process, there is no high precision control requirement, double frequency conversion control of wire drawing machine, the drawing part of the yarn tension through tension disc is by working procedure drawing tension automatic line, double frequency inverter controlled wire drawing machine, to use silk thread tension through the disc at wiring drawing link, means through wire drawing tension for wire unwinding

### (2) Wire drawing: (FR200-4T-4.0B, 4KW/380V)

There is different in wire drawing link to different metal materials, different product accuracy and requirements. The wire drawing part is controlled by one motor (As the host motor), the metal wire through the internal cone pulley, and after various mold and

gradually stretched to the required specifications of wire rod. Meanwhile, open coolant to mold cooling

(3) Winding: (FR200L—4T-7.5B)

Winding is the most important part of double frequency inverter control wire drawing machine, decisive impact to the performance of wire drawing machine.

The winding motor control winding disk for wire winding, wire rod after wire drawing link through tension balance bar, the function of balance bar to feedback current tension signal to slave drive, which will regulate output frequency according to the deviation of feedback signal, to ensure constant tension during winding process.

Wire rod through tension balance bar up to a guide roller, then to be towed to a guide roller of rolling machine which is controlled with move back-forth motion by single small motor, to ensure wire rod on the winding disk equally.

Winding motor controls the winding disk to rotate, and wind the wire rod from rolling machine to winding disk, then entire winding process completed. If wire is break during winding system will stop automatically and open brake system to stop winding disk immediately.

**3、Schematic wiring**

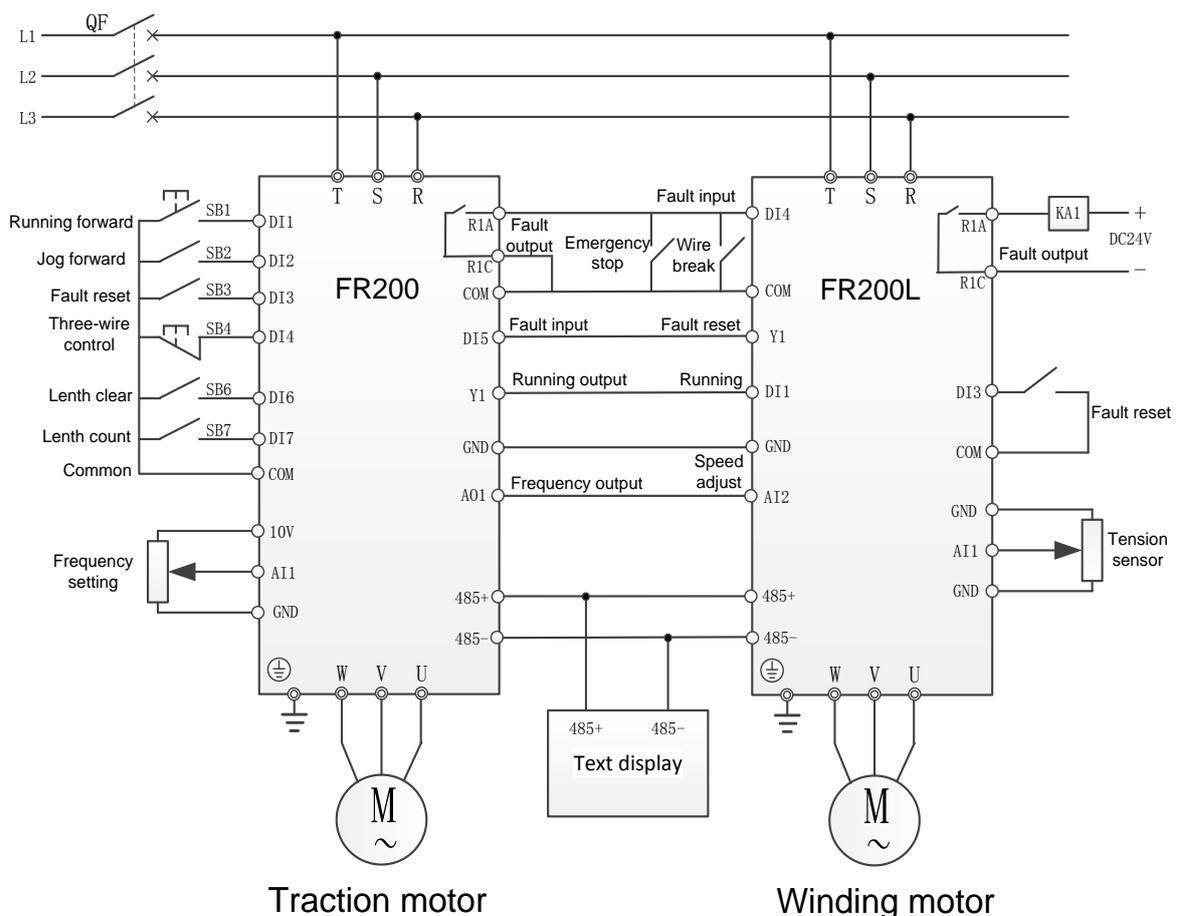


Figure 3-1

## 4.Main Parameter Setting

### 4.1 Traction motor inverter

Function Code	Name	Setting	Description
F00.09	DI7/HI input mode	1	DI7 high speed pulse input
F01.01	Master Frequency Command Source	2	Master frequency given by AI1
F01.08	Maximum frequency	75	Maximum frequency 75Hz
F01.09	Upper limit frequency	75	Upper limit frequency 75Hz
F02.00	Run command	1	Terminal start
F03.00	Accel time 1	60	Accel time 60s
F03.01	Decel time 1	60	Decel time 60s
F04.00	Function of terminal DI1	1	DI1 Running forward (FWD)
F04.01	Function of terminal DI2	4	DI2 JOG forward
F04.02	Function of terminal DI3	7	DI3 Fault reset (RESET)
F04.03	Function of terminal DI4	3	DI4 Three-wire contro
F04.04	Function of terminal DI5	9	DI5 External fault input
F04.05	Function of terminal DI6	35	DI6 Length clear
F04.06	Function of terminal DI7	34	DI7 Length count
F05.00	Y1 output function	21	Y1 brake output
F05.02	Relay 1 output function	2	R1 Fault output
F05.17	Brake control selection	1	Brake control enable
F05.18	Brake opened frequency	0.1	Brake opened frequency 0.1Hz
F05.22	Brake closed frequency	0.1	Brake closed frequency 0.1Hz
F07.00	AO1 output function	1	AO1 output frequency
F07.04	AO1 gain	0.5	AO1 gain 0.5
F14.05	Set length	*	Depend on application
F14.06	Number of pulses per meter	*	Depend on application
F14.07	Command when the length attained	*	Depend on application

Note: Inverter auto-turning required with right motor parameter

**4.2 Winding motor inverter**

Function Code	Name	Setting	Description
F02.00	Run command	1	Terminal start
F04.00	Function of terminal DI1	1	DI1 Running forward (FWD)
F04.02	Function of terminal DI3	7	DI3 Fault reset (RESET)
F04.03	Function of terminal DI4	9	External fault input
F05.00	Y1 output function	2	Y1 fault output
F05.02	Relay 1 output function	2	R1 fault output
H00.00	Type of wire drawing machine	1	Winding drive in water tank wire drawing machine
H00.02	Balance bar feedback source	0	A11
H00.03	Proportional gain P	4	Proportional gain P 4
H00.04	Integral time Ti	1.0	Integral time Ti 1.0
H00.07	Feedforward frequency given source	2	A12
H00.10	Roll diameter coefficient K starting value	150	Roll diameter coefficient K starting value 150
H00.23	Wire break control mod	020	Automatic determine, Coast to stop

Note: Inverter auto-turning required with right motor parameter

5、 Field application photo

